USDA SHEEP EXPERIMENT STATION (PWS 7170008)
SOURCE WATER ASSESSMENT FINAL REPORT

August 21, 2002

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated source water assessment area and sensitivity factors associated with the well and aquifer characteristics.

This report, *USDA Sheep Experiment Station, Dubois, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

Final susceptibility scores are derived from equally weighted system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other category results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic compounds (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The USDA Sheep Experiment Station drinking water system consists of two ground water well sources. Both wells have moderate susceptibility to all categories of potential contaminants: IOC, VOC, SOC, and microbial contamination. The lack of potential contaminant sources as well as the land use contributed to the ratings. Partial well logs for Well #1 was available, decreasing the score for hydrologic sensitivity and contributing to the overall moderate susceptibility ratings.

Total coliform were detected in the distribution system in August 1994 and March 1997, but there have been no detections at the wellheads. There have been no detections of VOCs or SOCs in any water chemistry tests. The IOC fluoride has been detected in both wells, but at levels below the maximum contaminant level (MCL) of 4.0 milligrams per liter (mg/L). Nitrate has been detected at background levels of less than 1.0 mg/L, far below the MCL of 10.0 mg/L.

The IOC arsenic was detected in Well #1 at 6 parts per billion (ppb) in December 1998. As this level is greater than ½ the currently revised MCL, the USDA Sheep Experiment Station should be mindful of these levels. The EPA has recently lowered the arsenic standard from 50 ppb to 10 ppb (October 2001). However, the agency has given public water systems until 2006 to be in compliance with the new standard. According to a press release posted on the EPA website (www.epa.gov), the EPA intends to provide up to $20 million over the next two years for research and development of more cost-effective technologies to help small systems meet the new standard and provide technical assistance to small system operators. EPA has released an issue paper, identifying and summarizing experiences with proven aboveground treatment alternatives for arsenic in ground water, and provides information on their relative effectiveness and cost (EPA 542-S-02-002). The EPA has also stated that it "will work with small communities to maximize grants and loans under current State Revolving Fund and Rural Utilities Service programs of the Department of Agriculture" (USEPA, 2001, para 5).

County agricultural land use practices have contributed to the ratings of “High” for county level nitrogen fertilizer use and total county level ag-chemical use. Though there have not been chemical problems with the system water, the USDA Sheep Experiment Station should be aware that the potential for contamination of the aquifer exists.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the USDA Sheep Experiment Station’s drinking water wells, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary surveys (inspections conducted every five years with the purpose of determining the physical condition of a water system’s components and its capacity), including protection of the wells from surface flooding. Also, disinfection practices should be implemented if microbial contamination becomes a problem. Though the USDA Sheep Experiment Station is currently below the MCL for arsenic, they should continue to monitor arsenic levels. If arsenic contamination should exceed the new drinking water standards after 2006, the USDA Sheep Experiment Station may need to investigate various engineering solutions to treat for this chemical. No chemicals should be stored or applied within the 50-foot radius of the wellheads. Additionally, there should be a focus on the implementation of practices aimed at reducing the leaching of farm chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources within the delineation zone. Since much of the designated protection areas are outside the direct jurisdiction of the USDA Sheep Experiment Station, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan. Public education topics could include household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR THE USDA SHEEP EXPERIMENT STATION, DUBOIS, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** Maps showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment is also included.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Wellhead or drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The public drinking water system for the USDA Sheep Experiment Station is comprised of two ground water wells that serve approximately 60 people through 20 connections. Situated in Clark County, the wells are located about 2 miles east of Interstate 15 north of Dubois (Figure 1).

Total coliform were detected in the distribution system in August 1994 and March 1997, but there have been no detections at the wellheads. There have been no detections of VOCs or SOCs in any water chemistry tests. The IOC fluoride has been detected in both wells, but at levels below the MCL of 4.0 mg/L. Nitrate has been detected at background levels of less than 1.0 mg/L, far below the MCL of 10.0 mg/L. The IOC arsenic was detected in Well #1 at 6 ppb in December 1998. As this level is greater than ½ the currently revised MCL, the USDA Sheep Experiment Station should be mindful of these levels. The EPA has recently lowered the arsenic standard from 50 ppb to 10 ppb (October 2001). However, the agency has given public water systems until 2006 to be in compliance with the new standard. County agricultural land use practices have contributed to the ratings of "High" for county level nitrogen fertilizer use and total county level ag-chemical use.

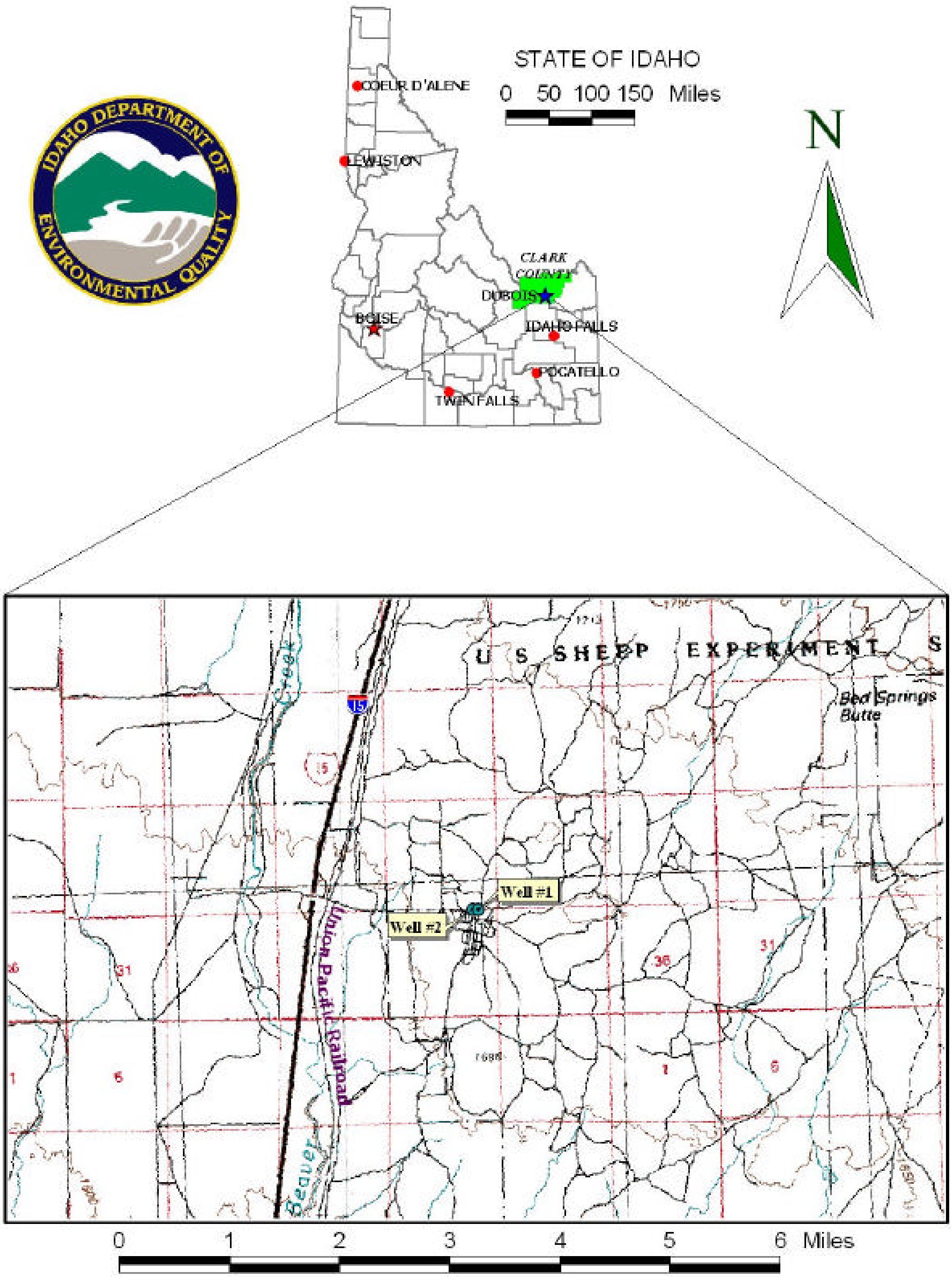
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ contracted with Washington Group, International (WGI) to perform the delineations using a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Snake River Plain (SRP) aquifer in the vicinity of the wells of the USDA Sheep Experiment Station. The computer model used site specific data, assimilated by WGI from a variety of sources including the USDA Sheep Experiment Station operator input, local area well logs, and hydrogeologic reports (detailed below).

The SRP is a northeast trending basin located in southeastern Idaho. Ten thousand square miles of the basin are primarily filled with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with terrestrial and lacustrine (lake-deposited) sediments along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet in thickness and average 20 to 25 feet (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

The plain is bound on the northeast by rocks of the Yellowstone Group (mainly rhyolite) and Idavada Volcanics to the southwest. The Snake River flows along part of the southern boundary and is the only drainage that leaves the plain. Rivers and streams entering the plain from the south are tributary to the Snake River. Other than the Big and Little Wood rivers, rivers entering from the north vanish into the highly transmissive basalts of the Snake River Plain aquifer.

FIGURE 1- Geographic Location of the USDA Sheep Experiment Station Wells



The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet it may be locally confined in some areas because of inter-bedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from several hundred feet near the plain's margin to thousands of feet near the center.

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

The Dubois area geology is characterized by basalt interbedded with clay, silt, and sand. The thickness of the sediment interbeds is highest in the Mud Lake area and decreases to the northeast and southwest (Spinazola, 1994, p. 13). Total sediment thickness is estimated from 0 to less than 1,000 feet (Spinazola, 1994, p. 13). Spinazola (1994, pp. 45 and 48-49) used hydraulic conductivities of 2,500 to 5,000 feet/day and 125 to 500 feet/day to represent the aquifer in the area between Mud Lake and Dubois and the area east of Dubois, respectively. Spinazola (1994, p. 52) used values ranging from less than 0.9 inch/year up to 11.3 inch/year to represent areal recharge from precipitation and irrigation within 10 miles of the cities of Mud Lake and Dubois. Areal recharge was reduced to 0.2 in./yr to improve the modeled fit. This recharge value is similar to the value obtained from an infiltration test at the Idaho National Engineering and Environmental Laboratory to the southeast of Mud Lake (0.4 in./yr) (Cecil et al., 1992).

The delineated source water assessment areas for the wells of the USDA Sheep Experiment Station can best be described as pie-shaped corridors approximately one mile long extending to the northeast of the wellheads (Figure 2 and Figure 3). The actual data used by WGI in determining the source water assessment delineation areas are available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and others, such as cryptosporidium, and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of groundwater contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

Land use within the immediate area of wells of the USDA Sheep Experiment Station consists of a research station, while the surrounding area is predominantly disturbed and dryland agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, including educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted in July through August 2001. The first phase involved identifying and documenting potential contaminant sources within the USDA Sheep Experiment Station source water assessment areas (Figures 2 and 3) through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to identify and add any additional potential sources in the area.

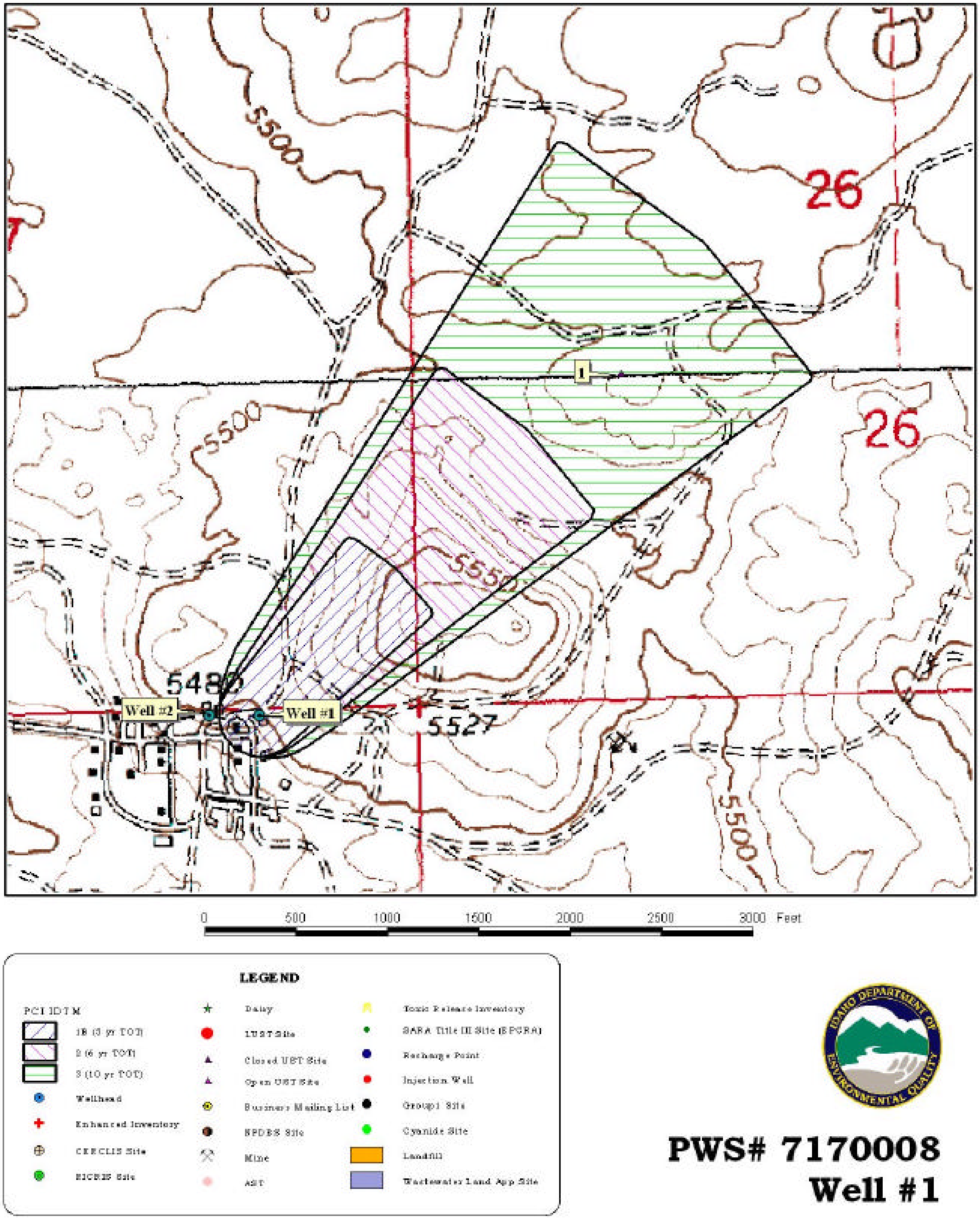
The delineated source water areas encompass pie-shaped corridors of land extending from the well sites to the northeast. The delineations (Table 1, Figure 2 and Figure 3) of both wells have one potential contaminant source in the 10-year TOT zone. This underground storage tank (UST) is a closed site related to the research station.

Table 1. Wells of the USDA Sheep Experiment Station, Potential Contaminant Inventory

Site #	Source Description[1]	TOT ZONE[2]	Source of Information	Potential Contaminants[3]
1	UST – closed	6 - 10	Database Search	VOC, SOC

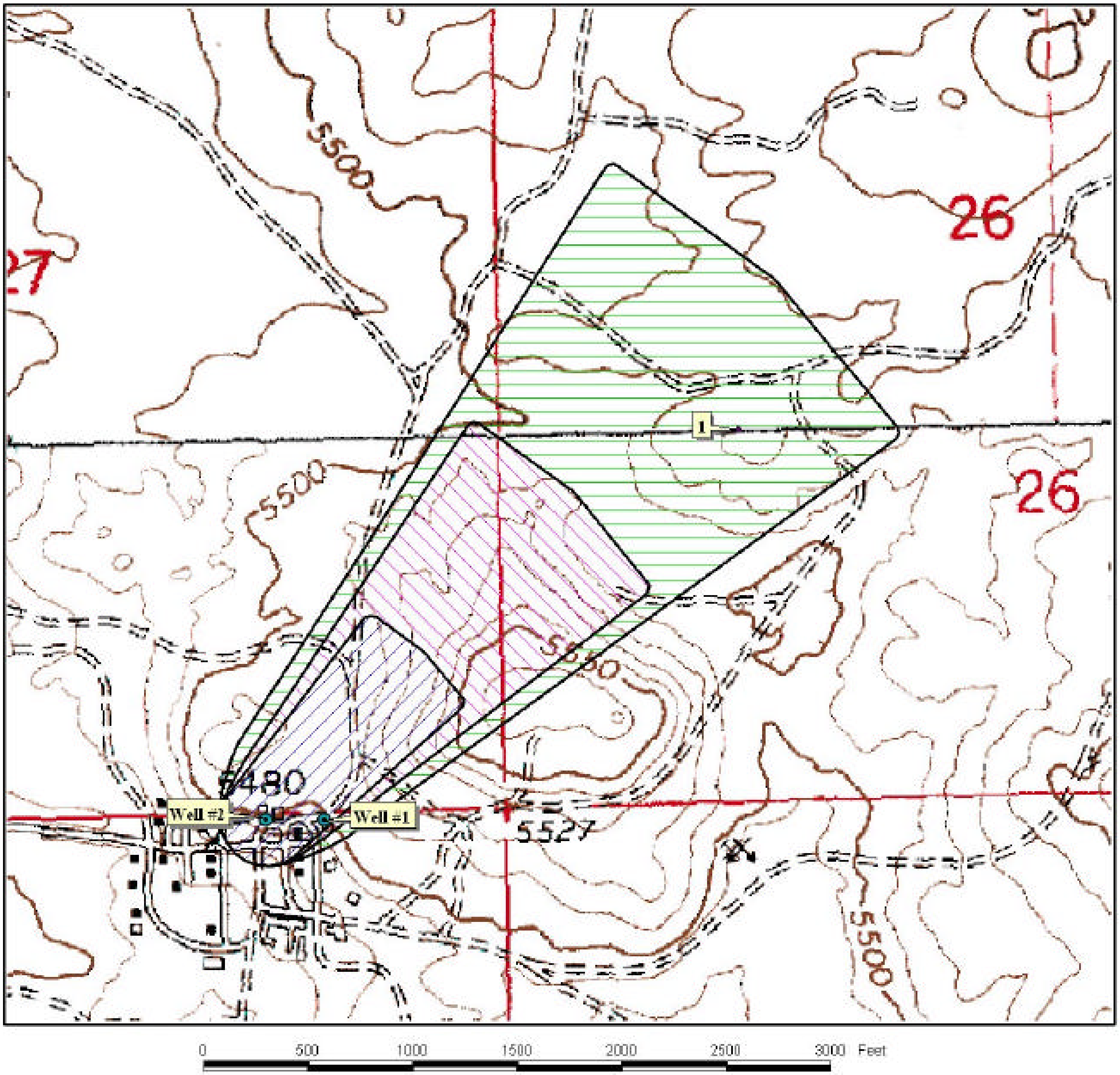
[1] UST = underground storage tank
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

FIGURE 2 - USDA Sheep Experiment Station Delineation Map and Potential Contaminant Source Locations



PWS# 7170008
Well #1

FIGURE 3 - USDA Sheep Experiment Station Delineation Map and Potential Contaminant Source Locations



PWS# 7170008
Well #2

Section 3. Susceptibility Analyses

Each well's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. Each of these three categories carries the same weight in the final assessment, meaning that a low score in one category coupled with higher scores in the other categories can still lead to a overall susceptibility of high. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Attachment A contains the susceptibility analysis worksheets for the system. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity rates moderate for Well #1 and high for Well #2 (Table 2). The soils surrounding the area of the wellheads are in the moderate to well-drained soil class. The available well log for Well #1 showed that the vadose was composed of fractured basalt, but that there are sedimentary interbeds totaling greater than 50 feet and that the water table depth is greater than 600 feet deep. As no well log was available for Well #2, no determination could be made regarding the presence of low permeability layers.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in sanitary surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

For the USDA Sheep Experiment Station, both wells have a moderate system construction score. The Well #1 log and the available sanitary surveys (DEQ, 1993; DEQ, 2000) provided the information about the wells' construction. Well #1, drilled in 1937, has 10-inch casing to 717 feet below ground surface (bgs) into black lava and eight-inch casing 764 feet bgs into gray lava. The 1993 sanitary survey states that the casing extends just five inches above the floor and the casing vent is just three inches above the floor. The 2000 sanitary survey does not note these deficiencies, implying that they have been corrected.

Lack of sanitary survey deficiencies implies that the wellhead and surface seal meet the regulations and that the wells are protected from surface flooding. There is less information about Well #2. Well #2, drilled in about 1920, has six-inch casing and is drilled to approximately 600 feet bgs. It is not protected from surface flooding and does not have an adequate wellhead seal.

Though the wells may have been in compliance with standards when they were completed, current public water system (PWS) well construction standards are more stringent. The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. These standards include provisions for well screens, pumping tests, and casing thicknesses to name a few. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. A 10-inch diameter well requires a casing thickness of at least 0.365-inches and a six-inch diameter well requires a casing thickness of at least 0.280-inches.

Potential Contaminant Source and Land Use

Both wells of the USDA Sheep Experiment Station rate low for IOCs (i.e. nitrates arsenic), VOCs (i.e. petroleum products), SOCs (i.e. pesticides), and microbial contaminants (i.e. bacteria). The lack of potential contaminant sources and little agricultural land within the delineations account for the lower scores.

Final Susceptibility Ranking

A detection above a drinking water standard MCL or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Additionally, if there are contaminant sources located within 50 feet of the source then the wellhead will automatically get a high susceptibility rating. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time of travel zone (Zone 1B) and agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, both of the USDA Sheep Experiment Station wells rate moderate for all categories of potential contaminants.

Table 2. Summary of USDA Sheep Experiment Station Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	M	L	L	L	L	M	M	M	M	M
Well #2	H	L	L	L	L	M	M	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

Overall, both of the wells of the USDA Sheep Experiment Station rank moderate susceptibility for IOCs, VOCs, SOCs, and microbial contaminants. The hydrologic sensitivity and system construction scores contributed greatly to the susceptibility ratings for the wells. The lack of potential contaminant sources reduced the overall scores.

Total coliform were detected in the distribution system in August 1994 and March 1997, but there have been no detections at the wellheads. There have been no detections of VOCs or SOCs in any water chemistry tests. The IOC fluoride has been detected in both wells, but at levels below the MCL of 4.0 mg/L. Nitrate has been detected at background levels of less than 1.0 mg/L, far below the MCL of 10.0 mg/L. The IOC arsenic was detected in Well #1 at 6 ppb in December 1998. As this level is greater than ½ the currently revised MCL, the USDA Sheep Experiment Station should be mindful of these levels. The EPA has recently lowered the arsenic standard from 50 ppb to 10 ppb (October 2001). However, the agency has given public water systems until 2006 to be in compliance with the new standard. County agricultural land use practices have contributed to the ratings of "High" for county level nitrogen fertilizer use and total county level ag-chemical use.

Section 4. Options for Drinking Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies. For the USDA Sheep Experiment Station's drinking water wells, drinking water protection activities should focus on correcting any deficiencies outlined in the sanitary surveys, including protection of the wells from surface flooding. Also, disinfection practices should be implemented if microbial contamination becomes a problem. Though the USDA Sheep Experiment Station is currently below the MCL for arsenic, they should continue to monitor arsenic levels. If arsenic contamination should exceed the new drinking water standards after 2006, the USDA Sheep Experiment Station may need to investigate various engineering solutions to treat for this chemical. No chemicals should be stored or applied within the 50-foot radius of the wellheads. Additionally, there should be a focus on the implementation of practices aimed at reducing the leaching of farm chemicals from agricultural land within the designated source water areas and awareness of the potential contaminant sources within the delineation zone. Since much of the designated protection areas are outside the direct jurisdiction of the USDA Sheep Experiment Station, collaboration and partnerships with state and local agencies, and industry groups should be established and are critical to the success of drinking water protection.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any source water protection plan as the delineation is near to urban and residential land uses. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. As there are transportation corridors through the delineation, the Idaho department of transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A community must incorporate a variety of strategies in order to develop a comprehensive source water assessment protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Idaho Falls Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Idaho Falls Regional DEQ Office (208) 528-2650

State DEQ Office (208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact Ms. Melinda Harper, Idaho Rural Water Association, at 208-343-7001 (mharper@idahoruralwater.com) for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund@ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5 mg/L.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Ackerman, D.J., 1995, Analysis of Steady-State Flow and Advective Transport in the Eastern Snake River Plain Aquifer System, Idaho, U.S. Geological Survey Water-Resources Investigations Report 94-4257, I-FY95, 25 p.

Cecil, L.D., J.R. Pittman, T.M. Beasley, R.L. Michel, P.W. Kubik, P. Sharma, U. Fehn, and H. Gove, 1992, Water Infiltration Rates in the Unsaturated Zone at the Idaho National Engineering Laboratory Estimated from Hhlorine-36 and Tritium Profiles, and Neutron Logging, Y.K. Kkharak and A.S. Meest, eds., Proceedings of the 7th International Symposium on Water Rock Interaction – WRI –7, Park City, Utah.

Garabedian, S.P., 1992, Hydrology and Digital Simulation of the Regional Aquifer System, Eastern Snake River Plain, Idaho, U.S. Geological Survey Professional Paper 1408-F, 102 p.

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997, "Recommended Standards for Water Works."

Idaho Department of Agriculture, 1998, Unpublished Data.

Idaho Department of Environmental Quality, 1997, Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Environmental Quality, 2000, Sanitary Survey for USDA Sheep Experiment Station.

Idaho Department of Water Resources, 1993, Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Idaho Division of Environmental Quality, 1993, Sanitary Survey for USDA Sheep Experiment Station.

Lindholm, G.F., 1996, Summary of the Snake River Plain Regional Aquifer-System Analysis in Idaho and Eastern Oregon, U.S. Geological Survey Professional Paper 1408-A, 59 p.

Spinazola, J.M., 1994, Geohydrology and Simulation of Flow and Water Levels in the Aquifer System in the Mud Lake Area of the Eastern Snake River Plain, Eastern Idaho, U.S. Geological Survey Water-Resources Investigations Report 93-4227, 78 p.

Washington Group International, 2001, Source Area Delineation Report: Snake Plain of the Eastern Snake River Plain Hydrologic Province, Prepared for the Idaho Department of Environmental Quality.

Whitehead, R.L., 1992, Geohydrological Framework of the Snake River Plain Regional Aquifer System, Idaho and Eastern Oregon, U.S. Geological Survey Professional Paper 1408-B, I-FY92, 32 p.

Attachment A

USDA Sheep Experiment Station Susceptibility Analysis Worksheets

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.375)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : USDA SHEEP EXPERIMENT STATION   Well# : WELL #1

Public Water System Number 7170008   07/09/2002 7:23:07 AM

1. System Construction		SCORE			
Drill Date	08/11/1937				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES	2000			
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	NO	2			
Highest production 100 feet below static water level	NO	1			
Well located outside the 100 year flood plain	YES	0			
	Total System Construction Score	4			
2. Hydrologic Sensitivity					
Soils are poorly to moderately drained	NO	2			
Vadose zone composed of gravel, fractured rock or unknown	YES	1			
Depth to first water > 300 feet	YES	0			
Aquitard present with > 50 feet cumulative thickness	YES	0			
	Total Hydrologic Score	3			
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	DRYLAND AGRICULTURE	1	1	1	1
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
	Total Potential Contaminant Source/Land Use Score - Zone 1A	3	1	3	1
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	YES	4	0	0	
4 Points Maximum		4	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Non-Irrigated Agricultural	2	2	2	2
	Total Potential Contaminant Source / Land Use Score - Zone 1B	6	2	2	2
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
	Potential Contaminant Source / Land Use Score - Zone II	0	0	0	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	0	1	1	
Sources of Class II or III leacheable contaminants or	YES	0	1	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
	Total Potential Contaminant Source / Land Use Score - Zone III	0	2	1	0
Cumulative Potential Contaminant / Land Use Score		9	5	6	3

		IOC	VOC	SOC	Microbial
4. Final Susceptibility Source Score		9	8	8	8
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate

Ground Water Susceptibility Report — Public Water System Name : USDA SHEEP EXPERIMENT STATION — Well# : WELL #2

Public Water System Number 7170008 — 07/09/2002 7:23:16 AM

1. System Construction		SCORE
Drill Date	01/01/1920	
Driller Log Available	NO	
Sanitary Survey (if yes, indicate date of last survey)	YES	2000
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	NO	1
Well located outside the 100 year flood plain	YES	0
	Total System Construction Score	4

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	YES	0
Aquitard present with > 50 feet cumulative thickness	NO	2
	Total Hydrologic Score	5

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	DRYLAND AGRICULTURE	1	1	1	1
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		3	1	3	1
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	NO	0	0	0	0
(Score = # Sources X 2) 8 Points Maximum		0	0	0	0
Sources of Class II or III leacheable contaminants or	YES	4	0	0	
4 Points Maximum		4	0	0	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Non-Irrigated Agricultural	2	2	2	2
Total Potential Contaminant Source / Land Use Score - Zone 1B		6	2	2	2
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Land Use Zone II	Less than 25% Agricultural Land	0	0	0	
Potential Contaminant Source / Land Use Score - Zone II		0	0	0	0
Potential Contaminant / Land Use - ZONE III					

Contaminant Source Present	YES	0	1	1	
Sources of Class II or III leacheable contaminants or	YES	0	1	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		0	2	1	0
Cumulative Potential Contaminant / Land Use Score		9	5	6	3
4. Final Susceptibility Source Score		11	10	10	10
5. Final Well Ranking		Moderate	Moderate	Moderate	Moderate